Norton Sound Summer Commercial Red King Crab Fishery
Observer Project Summary Report, 1990

By

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INTRODUCTION

The Norton Sound Section of the Eastern Bering Sea consists of all waters in statistical area Q that are north of the latitude of Cape Romanzof, east of 168 west longitude, and south of the latitude of Cape Prince of Wales (Figures 1 and 2). A large vessel summer commercial fishery has existed in this section since 1977.

The 1990 summer commercial fishery for red king crab (Paralithodes camtschatica) in the Norton Sound Section of the Eastern Bering Sea, began at 12 noon on August 1 and ended at 12 noon on August 5.

Four catcher/processor vessels participated in the 1990 summer commercial season. Last year a regulation (5AAC 39.645) was adopted by the Board of Fisheries mandating that all catcher/processors and floating processors which process king crab to have independent observers onboard. These observers work for independent contractors and are certified by The Alaska Department of Fish and Game. This is the second year subcontracted observers have been placed aboard commercial vessels in the Norton Sound area. One such observer was placed aboard each catcher/processor vessel prior to the start of the commercial fishery. The purpose of the placement of observers on fishing vessels is to 1) assist the managers in determining the magnitude and location of the commercial harvest 2) collect various biological data which will aid in determining the status of the stock, and 3) determine whether regulations are complied with.

Onboard observers provide the only effective means of collecting essential biological and management data from vessels that process shellfish, and this data is necessary to achieve a sustainable yield of the king crab resource. It is also, in the case of processing vessels, the only effective means to enforce regulations that protect this resource. Catcher vessels are not required to have an observer, but may choose to allow a Departmental observer onboard to collect data for the fishery. No catcher vessels participated this year and as a result no ADF&G observer participated in this fishery. The ADF&G has placed departmental observers aboard vessels during each of the prior nine years.

Objectives and Tasks

The specific objectives and associated tasks of the observer program are to:

1. Report the catch statistics daily (number of pots pulled and number of legal crab harvested) for each statistical area fished by the fishing vessel on which the observer is placed and the catch statistics of any vessels delivering to the observer's vessel.

2. Obtain samples of length frequency of harvested legal male crab (carapace width $\geq$ 4 3/4) and incidentally caught sublegal and female king crab (100 legal male crab per day and 100 combined sublegal male and female per day).

3. Determine mean live weight of the harvested legal male crab.

4. Determine the carapace age of the sampled crab.

5. Determine the percentage of new recruits in the commercial harvest.

6. Determine the degree of ovigerity for incidentally caught females.

7. Develop a relative abundance index of legal males, sublegal males and females by recording the catch of as many pot lifts as is required to obtain a sample size of 300 or more crab per day.

8. Determine the percentage of illegal commercial harvest by sampling a minimum of 600 crab over the course of the day for legal size and sex.

METHODS

The methods used this year for catch reporting, sampling crab, conducting skipper interviews, and collecting information from tagged crab are presented in the ADF&G Observer Manual for Alaskan Crab Processors. This publication is available through the ADF&G commercial fishery office in Nome. The identity of vessels from which observer data was obtained have been omitted from this report to maintain confidentiality.

As was the case last year the quality and quantity of the various types of data collected varied considerably from observer to observer. Some types of data were not collected at all by one observer. Another observer did not know how to identify new and old shell crab or how to collect information for a relative abundance index. Other data was obviously incorrect and had to be deleted from the data base.

RESULTS

Harvest Summary

Catch reporting logs were kept by observers on each vessel for each statistical area fished and were reported on a daily basis to the Fish and Game office in Nome. Vessels fished in 4 statistical areas (Table 1). This years fishing effort was highly concentrated in statistical area 666401. Most of the observer reported pot pulls and harvest occurred there. Area 666401 accounted for 88.5% of the pot pulls, area 666330 7.4%, area 676400 3.8%, and area 656401 for 0.3% of the pot pulls. Corresponding harvest for each of these areas was 91.1%, 7.0%, 1.7%, and 0.1% respectively. Data from fish tickets are similar; 84.6% of pot pulls from area 666401, 11.5% from area 666330, 3.7% from area 676400, and 0.2% from area 656401. Corresponding harvest data were 85.0%, 13.3%, 1.7%, and 0.1% respectively. Total pots pulled were 2,754, 374, 121, and 6 for these respective

areas. Total pots pulled for the season were 3,255 pots. Harvest for these respective areas were 52,306, 8,160, 1,036 and 61 crab. Total harvest for the season was 61,563 crab. Total poundage was 192,831 pounds.

Log summary sheets of observed pot lifts were kept by two out of four observers and partial information was obtained by the other two. Information was obtained for three of the four statistical areas fished. A summary log sheet by statistical area is presented in Table 2. Overall observed mean soak per pot was 34 hours. Overall observed mean catch per pot (CPP) of legal male king crab was 13.6 crab/pot with a CPP of 14.7, 25.0 and 5.7 for the areas 666401, 666330, and 676400 respectively. Information from area 666330 however consisted of only a single pot. Overall observed mean catch per pot, standardized for a 24 hour soak period (CPP/24hr), was 9.7 crab/pot (Table 2). Observed mean CPP/24hr was 10.1 in area 666401, 17.9 in 666330 and 5.4 in 676400. Daily harvest reports by observers included all four statistical areas fished and recorded CPP's of 8.9 in area 656401, 19.4 in area 666401, 17.8 in area 666330 and 8.6 in area 676400; overall CPP was 18.8 crab per pot. Data from fish ticket records yield CPP's of 10.2, 18.0, 21.8 and 8.6 for these same respective areas and an overall CPP of 18.9 crab per pot.

The observed catch rate of sublegal males was highest in area 666401 (2.9 cpp/24hr) as was female catch (0.2 cpp/24hr). Legal males made up 77% of the observed catch in area 666401 which is relatively near shore and about 90% of the observed catch in areas 666330 and 676400, which are farther off shore (Table 2). Legal male crab accounted for approximately 78% of the overall observed catch.

All four observers provided utilizable information on illegal harvest levels from their vessels. They sampled a total of 7,980 harvested crab. Of these 28 or 0.35% were illegal crab. Of these 27 were sublegal males and one was a female blue king crab (Paralithodes platypus). Of 17 vessel days sampled, illegal catch by individual vessels ranged from 0.0% to 1.0% of the harvest.

Legal Male King Crab

Carapace length, carapace age and crab weight data were collected by observers from the catch of each vessel. Data from one of the vessels was unusable. This observer appeared not to have correctly measured crab length, and also mistakenly listed almost all crab measured as old shell. Data collected by this observer was excluded from this report.

Carapace length measurements were collected from 1,289 legal male red king crab during the 1990 fishery (Table 3, Figure 3). Carapace age was also determined for each crab sampled. Carapace age was subjectively classified as new (11 months old) or old (at least 23 months old). King crab which possessed a new shell carapace accounted for 83% of the total legal male crab sampled, and old shell crab 17%. New shell crab made up 87% of the crab in area 656401, 82% in area 666401, 100% in area 666330 and 94% in area 676400. Corresponding sample sizes were 60, 1,113, 29, and 87 crab.

Overall mean length of sampled legal males from the summer season was 121.1mm. Mean carapace length measurements were 113.1, 121.4, 124.3 and 121.7mm for areas 656401, 666401, 666330, and 676400 respectively (Tables 4, 5, 6 & 7).

Recruit red king crab are defined as legal crabs less than or equal to 115mm in carapace length and possessing a new shell condition carapace. In the various samples taken throughout the duration of the fishery, recruit king crab ranged from 6% to 62% (Table 8). Recruit crab accounted for an average of only 21% of the total legal male king crab sampled (Table 8). Postrecruit king crab dominated the legal male crab sampled and comprised 79% of the population. Prerecruits, recruits, and post recruits made up 21%, 17%, and 62% respectively of this years observed male catch (Table 9, Figure 4).

Mean weight of legal crab was determined from a sample of 958 individuals. Mean weight of samples ranged from 2.6 to 3.4 pounds per crab. Overall mean weight for the entire legal male sample was 3.1 pounds (Table 10). Mean weight samples were obtained from areas 656401, 666401, 666330 and 676400 with corresponding mean weights of 2.8, 3.1, 3.3 and 3.1 respectively.

Sublegal (Prerecruit) Male King Crab

Carapace length measurement and shell age were collected from 527 sublegal male king crab (Table 11, Figure 5). New shell crab accounted for 87.5% of the sample. Overall mean length of the sublegal crab sample was 87.1mm.

Data was obtained this year from two statistical areas. Area 666401 had 87% new shell crab and area 676400 had 92% new shell crab. Overall mean length for area 666401 was 87.1mm and for area 676400 was 90.6mm (Tables 12 and 13). Sample size for area 666401 was 514 crab and only 13 crab for area 676400.

Overall observed mean catch of sublegal male king crab per pot, standardized to a 24 hour soak period (CPP/24hr) was 2.6 crab/pot (Table 2). Overall mean CPP/24hr was highest in statistical area 666401 (2.9), followed by area 666330 (2.1), and area 676400 (0.4). Relatively high sublegal king crab catches, equal to or greater than 10 CPP/24hr, occurred only in area 666401.

Female King Crab

During the commercial fishery, usable data was only obtained for 78 female king crab sampled for maturity and carapace length. Eighteen percent of the total female sample was immature (Table 14, Figure 6). Mean carapace length of immature female king crab was 65.9mm. Most of the mature female king crab, 75%, were considered to have a high degree of ovigerity ($\geq$ 60%). Mean carapace length of the adult female sample was 81.2mm (Table 14). Females were sampled only from one statistical area, 666401.

Overall observed mean catch per pot of female king crab standardized to a 24 hour soak period (CPP/24hr), was 0.2 crab. All females observed to be captured during relative abundance sampling by observers were taken in area 666401. Observers

reported encountering extremely few females over the course of the commercial season.

Bycatch

Bycatch information was collected at least to a limited degree at least by all observers. A total of 169 pots were sampled for bycatch. Quantifiable information yields a total bycatch of 205 arctic lyre crab (Hyas coarctatus), 22 blue king crab (21 female, 1 male), 2 opilio tanner crab (Chionoecetes opilio), 153 cod (Gadus macrocephalus), 21 pollock (Theragra chalcogramma), 11 yellowfin sole (Limanda aspera), 8 halibut (Hippoglossus stenolepis), 8 starry flounder (Platichthys stellatus), 6 sculpins, 1 rock sole (Lepidopsetta bilineata) and 1 unidentified species. In addition non quantifiable information from these same pots included 9 pots where arctic lyre crab were noted to have "occurred", 16 pots where there were "lots", and 7 pots where there were "even more". One additional yellowfin sole was noted where identification was uncertain. Eighteen starfish were also counted and 2 pots were noted with "lots". Starfish were considered unimportant however and were generally not quantified or noted as bycatch.

Most bycatch sample pots (147) were from statistical area 666401. In area 676400 21 pots were sampled. Catch per pot (CPP) based solely on quantifiable information for each species in area 666401 was 3.203 CPP for arctic lyre crab, .054 for blue king crab, .014 for opilio tanner crab, .531 for cod, .102 for pollock, .075 for yellowfin sole, .054 for halibut, .048 for starry flounder .041 for sculpins, 007 for rock sole, and .666 for starfish. Assuming the pots sampled which provided quantitative information to be a representative sample of those fished in area 666401, and using the number of pots pulled in this area based on fish tickets, bycatch in area 666401 was estimated to have consisted of roughly 8,821 arctic lyre crab, 150 blue king crab (131 female, 19 male), 37 opilio tanner crab, 1,461 cod, 281 pollock, 206 yellowfin sole, 150 halibut, 131 starry flounder, 112 sculpins, 19 rock sole and 1,836 starfish. For area 676400 the CPP was indeterminate for arctic lyre crab, .666 for blue king crab, 3.571 for cod, .029 for pollock and .048 for starry flounder. No other bycatch was recorded for the 21 pots sampled. Bycatch for this area was similarly projected to have been 81 female blue king crab, 432 cod, 35 pollock and 6 starry flounder. Combined CPP for both areas was 1.213 CPP for arctic lyre crab, .130 for blue king crab, .012 for opilio tanner crab, .905 for cod, .104 for pollock, .065 for yellowfin sole, .047 for halibut, .047 for starry flounder, .036 for sculpins, and .006 for rock sole.

DISCUSSION

Harvest Summary

During the 1990 red king crab fishery in the Norton Sound section, four catcher/processor vessels participated in the fishery. During most recent years the highest catch rates and effort have centered near 166 degrees west longitude

as they did in 1988 and 1989. This year fishing effort was concentrated west of this line - mostly within area 666401. Only 6 pots were pulled in area 656401 and no pot pulls were reported in area 656330. Both are usually productive areas and during the last 2 years most of the harvest has come from area 656401 though several different areas were fished. The intense sustained pressure occuring in area 666401 appeared to be the cause of a decline in CPP on the last day of the fishery, and combined with mechanical problems aboard one vessel on the last day, resulted in a slightly lower catch, 192,831 pounds, than the harvest goal of 200,000 pounds. Typically harvest has substantially improved rather than declined on the last day of the fishery as vessels focused in on the most productive areas and increased their effort. This year 91% of the observer reported harvest and 89% of the pot pulls occurred in area 666401. Statistical area 666330 accounted for about 7% of both the harvest and pot pulls with the remainder occurring in areas 676400 and 656401. Data from fish tickets are similar but record a somewhat higher proportion of harvest (13%) and pot pulls (12%) in area 666330.

Based on daily harvest reports by observers the CPP of legal males was similar in both areas 666401 (19 CPP) and 666330 (18 CPP). Based on observations recorded directly by observers the catch per pot was however, 15 and 25 respectively. The reason for this discrepancy may be the much smaller sample size directly observed and recorded by observers. In area 666401 145 pots were observed, and only I pot was observed in area 666330. Daily harvest reports of catch per pot for areas 676400 and 656401 were 9 CPP each, while observer observations in area 676400 indicated a CPP of 6 (with 22 pot pulls observed) and in area 656401 no observations were made. Data from fish tickets provide CPP's of 10, 18, 22, and 9 for area 656401, 666401, 666330, and 676400 respectively. Corresponding sample sizes were 6, 2,754, 374, and 121 pot pulls respectively. Overall CPP was 19 crab per pot. This compares with 19 CPP also from in season observer reports and 14 CPP based on direct observer observations of a limited sample size.

Catch per pot standardized for a 24 hour soak period (CPP/24hr) based on observer observations, was found to be 10 CPP/24hr overall, with the CPP/24hr for areas 666401, 666330, and 676400 being 10, 18, and 5 respectively. Again sample size for area 666330 consisted of only a single pot.

Legal males made up 77% of the observed catch in area 666401 which is relatively near shore and about 90% of the observed catch in areas 666330 and 676330, which are farther off shore (Table 2). This is as expected as adult males are larger and tend to migrate offshore faster and farther than the smaller sublegals and females. Legal male crab accounted for approximately 78% of the overall observed catch.

The four onboard observers sampled approximately 8,000 crab from the commercial catch to determine illegal harvest levels. Illegal harvest was found to be only 0.35% and ranged from 0% to 1.0% This is well below the 3.0% limit thought to be citable by Fish and Wildlife Protection. The low illegal harvest levels are probably in large part a result of the onboard observer program.

Legal Male King Crab

The overall mean carapace length of sampled legal males was 121.1mm and is similar to data from recent years. Mean carapace length was 121.7mm, 119.0mm and 119.8mm in 1987 (Sandone et al., 1988), 1988 (Gebhard and Lean, 1988), and 1989 (Gebhard and Lean, 1989) respectively. Mean carapace length from winter sampling was noticeably smaller; 115mm (Knuepfer and Gebhard, 1990). Comparing data from recent years shows that mean carapace length from winter samples have been consistently smaller than those from the summer. Winter mean carapace length for 1989 was 114.3mm (Bue and Lean, 1989) and 111.8mm in 1987 (Lean, 1987); no data was collected in 1988. The differing results are probably due to collection of differing subsamples of the population. In summer there is an offshore migration of king crab with the larger crab traveling farther faster and creating a more stratified population.

This year's legal male new shell/old shell crab ratio was 83% new shell, 17% old shell. This compares with 89% new shell, 11% old shell, in the winter sample. Last years summer sample new shell/old shell ratio was 71% to 29% and was identical with the ratio in that winter's sample (71% to 29% also).

Postrecruit crab dominated the 1990 harvest and recruitment to the harvestable stock was a relatively low 21% of the population. Low recruitment has occurred the previous 3 years as well. In 1987 recruits comprised 22% of the legal male population, in 1988 they comprised 25% and in 1989 they comprised 23%. The previous 5 year average for the period 1982 to 1986 was 47% recruit crab. The continued low recruitment suggests that the population continues to remain stabilized at its current low level. Despite a substantial reduction in the harvest goal to 200,000 pounds (roughly a 10% exploitation level) for the 1988, 1989, and 1990 seasons the fishery is still largely dependent on post recruit crab. Maintaining the current level of harvest at 10% with a recruitment level of 21% should allow for a slow gradual increase in the harvestable population.

Prerecruits, recruits and post recruits made up 21%, 17%, and 62% respectively of this years observed male catch (Table 8, Figure 4). Last year these percentages were 18%, 19%, and 63% respectively. This years slight increase in percentage of prerecruit crab suggest a slight improvement in the number of recruits which will be added to next years legal male population.

Mean weight of legal crab was 3.09 pounds per crab and sample averages ranged from 2.6 to 3.4 pounds (Table 10). Average weight in 1987 was 3.20 pounds, as compared to 3.15 pounds in 1988 and 3.12 pounds in 1989. The slight gradual decrease in average weight may be a reflection of a slow gradual improvement in the health of the population as younger year cohorts have gradually been added to the adult population.

Sublegal (Prerecruit) Male King Crab

Overall mean length of sampled sublegal crab from the summer commercial fishery was 87.1mm and is similar to the value of 88.4mm found in 1989. Mean length from the winter sample was somewhat larger, 92mm. Mean length from the prior winters sample was 87.3mm.

New shell crab comprised about 88% of this summers sample. It comprised 89% of the summer sample in 1987, 82% in 1988, and 75% in 1989. In contrast this winter's sample consisted of all new shell crab except for a single old shell crab and last years winter sample was comprised entirely of new shell. Reasons for this substantial difference in sublegal new shell/old shell aging between the summer and winter sampling is unclear. It suggests that either the difference is due to inaccurate shell aging by samplers in either the summer or winter fishery - or that different subsamples of the population are being examined at these differing times and places.

Overall mean catch of sublegal male king crab standardized for a 24 hour soak period (CPP/24hr) was 2.6 crab per pot (Table 2). Samples were only obtained from areas 666401 (CPP/24hr 2.9) and 676400 (CPP/24hr 2.1). Relatively high sublegal king crab catches, equal to or greater than 10 CPP/24hr, occurred only in area 666401.

Female King Crab

This years summer biological sample of females came entirely from area 666401. Relatively high catches of females (≥ 0.2 CPP/24hr) occurred only in area 666401 and probably occurred in the eastern half near the northern closure line. Data from last year and previous years suggest the closure line to be of biological significance in that much higher proportions of females tend to be found as the closure line is approached. Heavy incidental catch of female crab could result in decreased recruitment to the population and needs to be prevented. The CPP/24hr was 0.2 in area 666401 and 0.0 in areas 666330 and 676400. Sample size was small however (145, 1, and 22 pot pulls respectively).

Eighteen percent of this year's summer sample was composed of immature female crab. This compares with 10% last year and 20% during each of the 2 years prior to that. Mean carapace length of immature female king crab was 65.9mm, slightly smaller than the previous 3 years (68.1mm in 1989, 67.6mm in 1988, and 68.8mm in 1987). Sample size this year however was unusually small and consisted of only 14 juveniles.

Most of the mature female king crab, 75%, were considered to have a high degree of ovigerity (≥60%). This is a decline however over the previous 3 years; 78% in 1989, 89% in 1988, and 92% in 1987. Reasons for this decline are unknown.

Mean carapace length of adult females was 81.2mm and was similar to the previous 3 years; 80.1mm in 1989, 82.5mm in 1988 and 81.0mm in 1987.

Bycatch

Bycatch this year included 12 identified species: arctic lyre crab, blue king crab, opilio tanner crab, cod, pollock, yellowfin sole, halibut, starry flounder, sculpins, rock sole and starfish. Estimated bycatch for area 666401 consisted of 8,821 arctic lyre crab, 150 blue king crab (131 female, 19 male), 37 opilio tanner crab, 1,461 cod, 281 pollock, 206 yellowfin sole, 150 halibut, 131 starry flounder, 112 sculpins, 19 rock sole and 1,836 starfish. Sample size for

estimates in area 676400 was much smaller (21 pots). They project a bycatch in area 676400 of an indeterminate number of arctic lyre crab, 81 female blue king crab, 432 cod, 35 pollock and 6 starry flounder. Catch per pot of blue king crab was 12 times as great in area 676400 as in 666401; CPP of cod was 7 times as great; CPP of pollock was 3 times as great; and the CPP of starry flounder was the same in both areas.

Bycatch was classified as rare (≥ .0001 < .001 CPP), infrequent (≥ .001 < .01 CPP), occasional (≥ .01 < .1 CPP), common (≥ .1 < 1.0 CPP), frequent (≥ 1.0 < 10.0 CPP), and abundant (≥ 10.0 < 100.0 CPP). Based on this classification arctic lyre crab was frequent bycatch in area 666401; cod was common bycatch in area 666401 and frequent in area 676400; starfish was common bycatch in area 666401; blue king crab was occasional bycatch in area 666401 and common bycatch in area 676400; pollock was common bycatch in area 666401 and occasional bycatch in area 676400; starry flounder was occasional bycatch in both areas; halibut, yellowfin sole and sculpins were occasional bycatch in area 666401; and rock sole was infrequent bycatch in area 6666401.

Bycatch data this year was collected more systematically than last year and provided more usable information. Arctic lyre crab was noted to be frequent this year and appeared to be abundant last year. Starfish were common this year and frequent last year. Yellowfin sole, starry flounder and halibut were occasional in catches from both years. Cod was common in both years but appeared at a much higher rate in this year's bycatch. Blue king crab was common this year and appeared in much greater numbers in this year's bycatch than last year; this is probably in large part a result of fishing this year in area 676400. Pollock which was common in this year's bycatch was not noted to occur at all last year. Last year opilio tanner crab were common bycatch while this year they were only occasional bycatch. Sculpins were occasional bycatch for both years. Rock sole was infrequent bycatch this year and was not noted in last year's bycatch. Last year rockfish (Sebastes sp.), eelpout and korean hair crab (Erimacrus isenbeckii) appeared to be occasional bycatch but were not noted in this year's catch. Differences between these years are more likely due to the different areas fished (and where observers were when they chose to sample) than to changes in population abundance. Future data collection, however, may eventually provide relative abundance indices of certain species for some statistical fishing areas as well as the level of incidental catch in the summer commercial king crab fishery.

COMMENTS ON OBSERVER PROGRAM

This was the second year that the mandatory observer program for catcher processors was in effect in Norton Sound. Three of the observers had prior experience and one was a new observer. Two of the experienced observers collected all required information while the other two observers collected only limited usable information.

A full day intensive training (or refresher) course for all observers would be valuable prior to the summer commercial fishery. It should provide detailed step

by step instructions on data collection and entering data on forms. Observers should be given the sample forms that they will be using in the field and given practice in filling them out as they would on board, in a dry run with example data provided. Training should emphasize those areas that seemed to be a problem in the 1989 and 1990 seasons. Problem areas that should be addressed are listed below.

A. Data collection

1. Measure carapace width for legality and measure carapace length for biological purposes. Checking out each observer for ability to properly take both measurements would be well worthwhile.

2 Hands on training and verification of observers ability to age crab carapaces prior to the summer commercial season would help insure the accuracy of new and old shell determinations. Color photographs of new and old shell crab from previous summer seasons in the Norton Sound area could be used for this and if placed in each observers book could also provide an objective reference in the field.

3. If bycatch information is to be obtained the most important and common bycatch species of Norton Sound should be reviewed with observers.

B. Data logging

1. C/P Daily Summaries. It needs to be emphasized that items 1 to 4 on this form refer to information recorded on the 'Department of Fish & Game Legal Crab Tally Sheet' and not to any purely biological information gathered in season. Item 1 should refer to the total number of crab harvested that observers checked for legality on their tally sheet. It should be the sum of both legal and illegal crab recorded on the tally sheet. If harvested crab were sampled for length frequency and also checked for legality, legality should be recorded on the tally sheet as well to avoid confusion. Observers have mistakenly included the numbers of legal male, sublegal male, and female crab measured for biological purposes in these columns, mixing them in with the numbers seen in their legality checks from their tally sheets. Often observers did not include non-legal crab from their tally sheet as part of their total in item 1.

2. Field Form 1. Emphasis needs to be placed on collecting length frequencies for sublegal males and females. Also that measurements are of biological lengths. It is also necessary to carefully explain how to calculate % recruits.

3. Field Form 2. Emphasis needs to be placed on collection of pot information along with a detailed explanation of what is

required to properly fill out the form. This has been a consistent problem in both years of the observer program. It needs to be stressed that the purpose of this form is to provide a relative abundance index of the number of legal males, sublegal males, and females that are being pulled aboard in each pot. It also needs to be emphasized that this data is totally separate and distinct from the information to be collected on Field Form 1.

4. Catch Reporting Log. Emphasis needs to be placed on putting total daily catch data on this form or on the skipper interview form so that a daily catch summary is provided along with other information during final debriefing.

5. Department of Fish and Game Legal Crab Tally Sheet. Emphasis needs to continue to be placed that a minimum of 600 harvested crab per day are required to be checked on normal fishing days.

C. Changes in data forms

1. ADF&G Legal Crab Tally Sheet. This form would benefit from adding items 1-4 on the C/P Daily Summary form to the bottom of this sheet to summarize data.

2. C/P Daily Summaries. This form could easily be deleted as redundant, unnecessary, and confusing to observers. If retained items 1-4 should be transferred to the bottom of the ADF&G Legal Tally Sheet and items 8-12 should be omitted entirely; items 8-12 are either ignored or misinterpreted, and don't provide useful data.

3. Field Form 1.

a. This form should be modified so that the legal male length frequency of new shell crab is boxed in from the top of the column down to and including carapace length 115mm.
b. The definition of recruit should be footnoted on this form. c. The bottom line should be corrected to read: "% Recruits= #Recruit/Total Legal Males".
d. Columns for length frequency should be widened to make data easier both to record and to read.
e. A column should be added for 0% ovigerity.

4. Field Form 2.
a. The last column should be relabeled lat./long. to encourage identification of the string location they are observing. No catcher/processor observer obtained this information which is valuable for determining the specific distribution of the various segments of the population.
b. Column 3, # pots, should be changed back to buoy #. Less confusion and more accurate recordings will be obtained if

data is recorded for each pot that is observed for use as a relative abundance index rather than as just a summary sheet for entire or partial strings.

5. Bycatch Form. A bycatch form developed specifically for Norton Sound, with column headings listing the more common bycatch, would be useful. A separate form encourages the collection of this information and makes what information is collected more reliable and interpretable; bycatch still sometimes appears as scribbled notes on Field Form 2. Field Form 2 has no room for detailed recordings unless the form is substantially condensed and redone.

SUMMARY

During most years the highest catch rates and effort center near 166 degrees west longitude as they did in 1988 and 1989. This year fishing effort was concentrated west of this line - mostly within area 666401. This intense sustained pressure on one limited area appeared to be the cause of a decline in CPP on the last day of the fishery, and in combination with mechanical difficulties on board one vessel, resulted in a catch slightly lower than the harvest goal of 200,000 pounds. Typically harvest has improved the last day as vessels focused in on the most productive areas and increased their effort. Mean weight of harvested crab was 3.1 pounds and mean carapace length was 121.1mm. Post recruit crab dominated the 1990 harvest and recruitment to the harvestable stock was relatively low. Low recruitment occurred the previous three years as well. Despite a substantial reduction in the harvest goal to 200,000 pounds (roughly a 10% exploitation level) for the 1988, 1989, and 1990 seasons the fishery is still largely dependent on post recruit crab. Maintaining the current level of harvest at 10% with a recruitment level of 21% should allow for a slow gradual increase in the harvestable population. A possible note of concern however is that female ovigerity seems to have undergone a moderate but steady decline in recent years and during the period from 1987 to 1990 has gone from 92% having a high degree of ovigerity ($\geq$ 60%) to only 75% having a high degree of ovigerity. Illegal harvest was substantially less than 1.0% and this low level is in part a result of the onboard observer program.

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Table 1. Red king crab harvest summary for observer fishing vessels, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Date	656401 pots	656401 crab	666401 pots	666401 crab	666330 pots	666330 crab	676400 pots	676400 crab
8/1-8/2			50	849				
8/2-8/3	3	19	837	17188	136	2814	21	142
8/3-8/4	6	61	791	17836			35	296
8/4-8/5			1149	18867	102	1418	65	605
Total	9	80	2827	54740	238	4232	121	1043
Catch per pot		8.9		19.4		17.8		8.6
Percent of harvest		0.1		91.1		7.0		1.7
Total Pots		3195						
Total Harvest		60095						
CPP		18.8						

Table 2. Observer crab catch summary; number of observed pot lifts, average soak time, number of legal males, sublegal males, and females and proportion (%) of each captured by statistical area, and the corresponding mean number of crab caught per observed pot lift (CPP) and pot lift standardized to a 24 hour soak period (CPP/24hr), Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Stat. Area	#Pot Lifts	Ave. Soak Time	Legal Males				Sublegal males				Females			
			number	%	CPP	CPP /24h	number	%	CPP	CPP /24h	number	%	CPP	CPP /24h
666401	145	35.1	2138	76.9%	14.7	10.1	605	21.8%	4.2	2.9	36	1.3%	0.2	0.2
666330	1	33.6	25	89.3%	25.0	17.9	3	10.7%	3.0	2.1	0	0.0%	0.0	0.0
676400	22	25.4	126	92.6%	5.7	5.4	10	7.4%	0.5	0.4	0	0.0%	0.0	0.0
TOTAL	168	33.8	2289		13.6	9.7	618		3.7	2.6	36		0.2	0.2
Percent of obs. catch				77.8%				21.0%				1.2%		
Total crab obs.			2943											

Table 3. Carapace length measurement summary of sampled legal male red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
101	3	0.28	0.3%		0.00	0.0%	3	0.24	0.2%
102	8	0.76	0.7%	1	0.47	0.5%	9	0.71	0.7%
103	8	0.77	0.7%		0.00	0.0%	8	0.64	0.6%
104	6	0.58	0.6%	2	0.95	0.9%	8	0.65	0.6%
105	10	0.98	0.9%	2	0.96	0.9%	12	0.98	0.9%
106	14	1.39	1.3%	1	0.48	0.5%	15	1.23	1.2%
107	14	1.40	1.3%	2	0.98	0.9%	16	1.33	1.2%
108	23	2.32	2.1%	3	1.48	1.4%	26	2.18	2.0%
109	13	1.32	1.2%	4	1.99	1.8%	17	1.44	1.3%
110	25	2.57	2.3%	3	1.51	1.4%	28	2.39	2.2%
111	19	1.97	1.8%	5	2.53	2.3%	24	2.07	1.9%
112	37	3.87	3.5%	11	5.63	5.0%	48	4.17	3.7%
113	24	2.53	2.2%	15	7.74	6.8%	39	3.42	3.0%
114	35	3.73	3.3%	11	5.73	5.0%	46	4.07	3.6%
115	34	3.65	3.2%	8	4.20	3.7%	42	3.75	3.3%
116	37	4.01	3.5%	10	5.30	4.6%	47	4.23	3.6%
117	48	5.25	4.5%	11	5.88	5.0%	59	5.36	4.6%
118	61	6.73	5.7%	10	5.39	4.6%	71	6.50	5.5%
119	46	5.12	4.3%	12	6.52	5.5%	58	5.35	4.5%
120	47	5.27	4.4%	12	6.58	5.5%	59	5.49	4.6%
121	47	5.31	4.4%	6	3.32	2.7%	53	4.98	4.1%
122	51	5.81	4.8%	7	3.90	3.2%	58	5.49	4.5%
123	41	4.71	3.8%	8	4.49	3.7%	49	4.68	3.8%
124	45	5.21	4.2%	10	5.66	4.6%	55	5.29	4.3%
125	47	5.49	4.4%	7	4.00	3.2%	54	5.24	4.2%
126	46	5.42	4.3%	13	7.48	5.9%	59	5.77	4.6%
127	35	4.15	3.3%	5	2.90	2.3%	40	3.94	3.1%
128	29	3.47	2.7%	4	2.34	1.8%	33	3.28	2.6%
129	44	5.30	4.1%	5	2.95	2.3%	49	4.90	3.8%
130	41	4.98	3.8%	5	2.97	2.3%	46	4.64	3.6%
131	11	1.35	1.0%	3	1.79	1.4%	14	1.42	1.1%
132	23	2.84	2.1%	7	4.22	3.2%	30	3.07	2.3%
133	10	1.24	0.9%	2	1.21	0.9%	12	1.24	0.9%
134	15	1.88	1.4%		0.00	0.0%	15	1.56	1.2%
135	9	1.14	0.8%	2	1.23	0.9%	11	1.15	0.9%
136	14	1.78	1.3%		0.00	0.0%	14	1.48	1.1%
137	9	1.15	0.8%	2	1.25	0.9%	11	1.17	0.9%
138	7	0.90	0.7%		0.00	0.0%	7	0.75	0.5%
139	7	0.91	0.7%		0.00	0.0%	7	0.75	0.5%
140	3	0.39	0.3%	1	0.64	0.5%	4	0.43	0.3%
141	7	0.92	0.7%	1	0.64	0.5%	8	0.88	0.6%
142	4	0.53	0.4%	1	0.65	0.5%	5	0.55	0.4%
143	1	0.13	0.1%	3	1.96	1.4%	4	0.44	0.3%
144	3	0.40	0.3%		0.00	0.0%	3	0.34	0.2%
145	2	0.27	0.2%		0.00	0.0%	2	0.22	0.2%
146	1	0.14	0.1%		0.00	0.0%	1	0.11	0.1%
147	2	0.27	0.2%	2	1.34	0.9%	4	0.46	0.3%
148		0.00	0.0%	1	0.68	0.5%	1	0.11	0.1%
149	1	0.14	0.1%		0.00	0.0%	1	0.12	0.1%
150	1	0.14	0.1%		0.00	0.0%	1	0.12	0.1%
151	1	0.14	0.1%		0.00	0.0%	1	0.12	0.1%
152		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
153		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
154		0.00	0.0%	1	0.70	0.5%	1	0.12	0.1%
155		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
156		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
157	1	0.15	0.1%		0.00	0.0%	1	0.12	0.1%
Total No.	1070		83.0%	219		17.0%	1289		100.0%
Mean		121.2			120.6			121.1	

Total legals 1289

Total Recruits 273
Percent 21.2%

Total Post Recruits 1016
Percent 78.8%

Table 4. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 656401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5 1980.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
101	1	1.94	1.9%		0.00	0.0%	1	1.68	1.7%
102	4	7.85	7.7%		0.00	0.0%	4	6.80	6.7%
103	4	7.92	7.7%		0.00	0.0%	4	6.87	6.7%
104	2	4.00	3.8%		0.00	0.0%	2	3.47	3.3%
105	1	2.02	1.9%		0.00	0.0%	1	1.75	1.7%
106	3	6.12	5.8%		0.00	0.0%	3	5.30	5.0%
107	7	14.40	13.5%		0.00	0.0%	7	12.48	11.7%
108	4	8.31	7.7%		0.00	0.0%	4	7.20	6.7%
109	2	4.19	3.8%		0.00	0.0%	2	3.63	3.3%
110		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
111	3	6.40	5.8%		0.00	0.0%	3	5.55	5.0%
112	2	4.31	3.8%		0.00	0.0%	2	3.73	3.3%
113		0.00	0.0%	1	14.13	12.5%	1	1.88	1.7%
114	1	2.19	1.9%	1	14.25	12.5%	2	3.80	3.3%
115	3	6.63	5.8%		0.00	0.0%	3	5.75	5.0%
116	1	2.23	1.9%		0.00	0.0%	1	1.93	1.7%
117	2	4.50	3.8%	1	14.63	12.5%	3	5.85	5.0%
118		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
119	1	2.29	1.9%	1	14.88	12.5%	2	3.97	3.3%
120	1	2.31	1.9%	1	15.00	12.5%	2	4.00	3.3%
121	1	2.33	1.9%		0.00	0.0%	1	2.02	1.7%
122	2	4.69	3.8%		0.00	0.0%	2	4.07	3.3%
123		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
124	1	2.38	1.9%		0.00	0.0%	1	2.07	1.7%
125	2	4.81	3.8%	1	15.63	12.5%	3	6.25	5.0%
126	1	2.42	1.9%	1	15.75	12.5%	2	4.20	3.3%
127		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
128	1	2.46	1.9%	1	16.00	12.5%	2	4.27	3.3%
129		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
130		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
131		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
132		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
133	1	2.56	1.9%		0.00	0.0%	1	2.22	1.7%
134		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
135		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
136		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
137		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
138		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
139		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
140		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
141		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
142	1	2.73	1.9%		0.00	0.0%	1	2.37	1.7%
Total No.	52		86.7%	8		13.3%	60		100.0%
Mean		112.0			120.2			113.1	

Total legals	60	
Total Recruits	37	
Percent		61.7%
Total Post Recruits	23	
Percent		38.3%

Table 5. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 666401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5 1990.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
101	2	0.22	0.2%		0.00	0.0%	2	0.18	0.2%
102	4	0.45	0.4%		0.00	0.0%	4	0.37	0.4%
103	4	0.45	0.4%		0.00	0.0%	4	0.37	0.4%
104	3	0.34	0.3%	2	1.01	1.0%	5	0.47	0.4%
105	9	1.04	1.0%	2	1.02	1.0%	11	1.04	1.0%
106	8	0.93	0.9%	1	0.51	0.5%	9	0.86	0.8%
107	5	0.59	0.6%	2	1.04	1.0%	7	0.67	0.6%
108	18	2.14	2.0%	3	1.57	1.5%	21	2.04	1.9%
109	11	1.32	1.2%	4	2.12	1.9%	15	1.47	1.3%
110	20	2.43	2.2%	3	1.60	1.5%	23	2.27	2.1%
111	15	1.84	1.7%	5	2.69	2.4%	20	1.99	1.8%
112	33	4.07	3.6%	11	5.98	5.3%	44	4.43	4.0%
113	24	2.99	2.6%	13	7.13	6.3%	37	3.76	3.3%
114	32	4.02	3.5%	10	5.53	4.9%	42	4.30	3.8%
115	29	3.68	3.2%	8	4.47	3.9%	37	3.82	3.3%
116	32	4.09	3.5%	10	5.63	4.9%	42	4.38	3.8%
117	41	5.29	4.5%	8	4.54	3.9%	49	5.15	4.4%
118	51	6.64	5.6%	10	5.73	4.9%	61	6.47	5.5%
119	38	4.99	4.2%	11	6.35	5.3%	49	5.24	4.4%
120	44	5.82	4.9%	11	6.41	5.3%	55	5.93	4.9%
121	39	5.20	4.3%	6	3.52	2.9%	45	4.89	4.0%
122	43	5.78	4.7%	7	4.15	3.4%	50	5.48	4.5%
123	40	5.42	4.4%	8	4.78	3.9%	48	5.30	4.3%
124	37	5.06	4.1%	10	6.02	4.9%	47	5.24	4.2%
125	40	5.51	4.4%	6	3.64	2.9%	46	5.17	4.1%
126	42	5.83	4.6%	12	7.34	5.8%	54	6.11	4.9%
127	33	4.62	3.6%	5	3.08	2.4%	38	4.34	3.4%
128	24	3.39	2.6%	3	1.86	1.5%	27	3.11	2.4%
129	40	5.59	4.4%	5	3.13	2.4%	45	5.22	4.0%
130	38	5.45	4.2%	5	3.16	2.4%	43	5.02	3.9%
131	9	1.30	1.0%	3	1.91	1.5%	12	1.41	1.1%
132	20	2.91	2.2%	6	3.84	2.9%	26	3.08	2.3%
133	5	0.73	0.6%	2	1.29	1.0%	7	0.84	0.6%
134	12	1.77	1.3%		0.00	0.0%	12	1.44	1.1%
135	7	1.04	0.8%	2	1.31	1.0%	9	1.09	0.8%
136	13	1.95	1.4%		0.00	0.0%	13	1.59	1.2%
137	8	1.21	0.9%	2	1.33	1.0%	10	1.23	0.9%
138	5	0.76	0.6%		0.00	0.0%	5	0.62	0.4%
139	6	0.92	0.7%		0.00	0.0%	6	0.75	0.5%
140	3	0.46	0.3%	1	0.68	0.5%	4	0.50	0.4%
141	6	0.93	0.7%	1	0.68	0.5%	7	0.89	0.6%
142	3	0.47	0.3%	1	0.69	0.5%	4	0.51	0.4%
143	1	0.16	0.1%	3	2.08	1.5%	4	0.51	0.4%
144	3	0.48	0.3%		0.00	0.0%	3	0.39	0.3%
145	1	0.16	0.1%		0.00	0.0%	1	0.13	0.1%
146	1	0.16	0.1%		0.00	0.0%	1	0.13	0.1%
147	2	0.32	0.2%	2	1.43	1.0%	4	0.53	0.4%
148		0.00	0.0%	1	0.72	0.5%	1	0.13	0.1%
149		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
150	1	0.17	0.1%		0.00	0.0%	1	0.13	0.1%
151	1	0.17	0.1%		0.00	0.0%	1	0.14	0.1%
152		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
153		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
154		0.00	0.0%	1	0.75	0.5%	1	0.14	0.1%
155		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
156		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
157	1	0.17	0.1%		0.00	0.0%	1	0.14	0.1%
Total No.	907		81.5%	206		18.5%	1113		100.0%
Mean		121.6			120.7			121.4	

Total Legals	1113
Total Recruits	217
Percent	19.5%
Total Post Recruits	896
Percent	80.5%

Table 6. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 666330 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5 1990.

Carapace Length (mm)	New shell No.	Ave Length Calc.	%
110	1	3.79	3.4%
111		0.00	0.0%
112		0.00	0.0%
113		0.00	0.0%
114	1	3.93	3.4%
115		0.00	0.0%
116	1	4.00	3.4%
117	1	4.03	3.4%
118	2	8.14	6.9%
119	1	4.10	3.4%
120		0.00	0.0%
121	3	12.52	10.3%
122	1	4.21	3.4%
123	1	4.24	3.4%
124	2	8.55	6.9%
125		0.00	0.0%
126	3	13.03	10.3%
127		0.00	0.0%
128	4	17.66	13.8%
129	2	8.90	6.9%
130	2	8.97	6.9%
131	1	4.52	3.4%
132	2	9.10	6.9%
133		0.00	0.0%
134	1	4.62	3.4%
Total No.	29		100.0%
Mean		124.3	

Total legals	29
Total Recruits	2
Percent	6.9%
Total Post Recruits	27
Percent	93.1%

Table 7. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 676400 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5 1990.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
102		0.00	0.0%	1	20.40	20.0%	1	1.17	1.1%
103		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
104	1	1.27	1.2%		0.00	0.0%	1	1.20	1.1%
105		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
106	3	3.88	3.7%		0.00	0.0%	3	3.66	3.4%
107	2	2.61	2.4%		0.00	0.0%	2	2.46	2.3%
108	1	1.32	1.2%		0.00	0.0%	1	1.24	1.1%
109		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
110	4	5.37	4.9%		0.00	0.0%	4	5.06	4.6%
111	1	1.35	1.2%		0.00	0.0%	1	1.28	1.1%
112	2	2.73	2.4%		0.00	0.0%	2	2.57	2.3%
113		0.00	0.0%	1	22.60	20.0%	1	1.30	1.1%
114	1	1.39	1.2%		0.00	0.0%	1	1.31	1.1%
115	2	2.80	2.4%		0.00	0.0%	2	2.64	2.3%
116	3	4.24	3.7%		0.00	0.0%	3	4.00	3.4%
117	4	5.71	4.9%	2	46.80	40.0%	6	8.07	6.9%
118	8	11.51	9.8%		0.00	0.0%	8	10.85	9.2%
119	6	8.71	7.3%		0.00	0.0%	8	8.21	6.9%
120	2	2.93	2.4%		0.00	0.0%	2	2.76	2.3%
121	4	5.90	4.9%		0.00	0.0%	4	5.56	4.6%
122	5	7.44	6.1%		0.00	0.0%	5	7.01	5.7%
123		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
124	5	7.56	6.1%		0.00	0.0%	5	7.13	5.7%
125	5	7.62	6.1%		0.00	0.0%	5	7.18	5.7%
126		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
127	2	3.10	2.4%		0.00	0.0%	2	2.92	2.3%
128		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
129	2	3.15	2.4%		0.00	0.0%	2	2.97	2.3%
130	1	1.59	1.2%		0.00	0.0%	1	1.49	1.1%
131	1	1.60	1.2%		0.00	0.0%	1	1.51	1.1%
132	1	1.61	1.2%	1	26.40	20.0%	2	3.03	2.3%
133	4	6.49	4.9%		0.00	0.0%	4	6.11	4.6%
134	2	3.27	2.4%		0.00	0.0%	2	3.08	2.3%
135	2	3.29	2.4%		0.00	0.0%	2	3.10	2.3%
136	1	1.66	1.2%		0.00	0.0%	1	1.56	1.1%
137	1	1.67	1.2%		0.00	0.0%	1	1.57	1.1%
138	2	3.37	2.4%		0.00	0.0%	2	3.17	2.3%
139	1	1.70	1.2%		0.00	0.0%	1	1.60	1.1%
140		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
141	1	1.72	1.2%		0.00	0.0%	1	1.62	1.1%
142		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
143		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
144		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
145	1	1.77	1.2%		0.00	0.0%	1	1.67	1.1%
146		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
147		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
148		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
149	1	1.82	1.2%		0.00	0.0%	1	1.71	1.1%
Total No.	82		94.3%	5		5.7%	87		100.0%
Mean		122.1			116.2			121.7	

Total legals 87

Total Recruits 17
Percent 19.5%

Total Post Recruits 70
Percent 80.5%

Table 8. Percent of newly recruited male king crab by statistical area, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Statistical Area	# Crab	% Recruits	Range of % Recruits	# of vessel days sampled
656401	60	62%	62%	1
666401	1113	20%	6-31%	12
666330	29	7%	7%	1
676400	87	20%	20%	1
Total	1289	21%	6-62%	15

Table 9. Carapace length measurement summary of Prerecruit, Recruit, and Postrecruit male red king crab, captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

CARAPACE LTH. (mm)	PRERECRUIT (Sublegal) No.	FREQ. %	RECRUIT WT. No	No.	FREQ. %	POSTRECRUIT Wt. No.	No.	FREQ. %	TOTALS No.	FREQ. %
60	10	0.40%	0		0.00%	0		0.00%	10	0.40%
61	2	0.08%	0		0.00%	0		0.00%	2	0.08%
62	7	0.28%	0		0.00%	0		0.00%	7	0.28%
63	1	0.04%	0		0.00%	0		0.00%	1	0.04%
64	4	0.16%	0		0.00%	0		0.00%	4	0.16%
65	2	0.08%	0		0.00%	0		0.00%	2	0.08%
66	5	0.20%	0		0.00%	0		0.00%	5	0.20%
67	2	0.08%	0		0.00%	0		0.00%	2	0.08%
68	5	0.20%	0		0.00%	0		0.00%	5	0.20%
69	4	0.16%	0		0.00%	0		0.00%	4	0.16%
70	6	0.24%	0		0.00%	0		0.00%	6	0.24%
71	6	0.24%	0		0.00%	0		0.00%	6	0.24%
72	10	0.40%	0		0.00%	0		0.00%	10	0.40%
73	4	0.16%	0		0.00%	0		0.00%	4	0.16%
74	7	0.28%	0		0.00%	0		0.00%	7	0.28%
75	10	0.40%	0		0.00%	0		0.00%	10	0.40%
76	11	0.44%	0		0.00%	0		0.00%	11	0.44%
77	11	0.44%	0		0.00%	0		0.00%	11	0.44%
78	13	0.52%	0		0.00%	0		0.00%	13	0.52%
79	23	0.93%	0		0.00%	0		0.00%	23	0.93%
80	18	0.73%	0		0.00%	0		0.00%	18	0.73%
81	12	0.48%	0		0.00%	0		0.00%	12	0.48%
82	10	0.40%	0		0.00%	0		0.00%	10	0.40%
83	9	0.36%	0		0.00%	0		0.00%	9	0.36%
84	19	0.77%	0		0.00%	0		0.00%	19	0.77%
85	16	0.65%	0		0.00%	0		0.00%	16	0.65%
86	18	0.73%	0		0.00%	0		0.00%	18	0.73%
87	9	0.36%	0		0.00%	0		0.00%	9	0.36%
88	15	0.61%	0		0.00%	0		0.00%	15	0.61%
89	11	0.44%	0		0.00%	0		0.00%	11	0.44%
90	18	0.73%	0		0.00%	0		0.00%	18	0.73%
91	8	0.32%	0		0.00%	0		0.00%	8	0.32%
92	19	0.77%	0		0.00%	0		0.00%	19	0.77%
93	14	0.56%	0		0.00%	0		0.00%	14	0.56%
94	22	0.89%	0		0.00%	0		0.00%	22	0.89%
95	18	0.73%	0		0.00%	0		0.00%	18	0.73%
96	21	0.85%	0		0.00%	0		0.00%	21	0.85%
97	15	0.61%	0		0.00%	0		0.00%	15	0.61%
98	16	0.65%	0		0.00%	0		0.00%	16	0.65%
99	11	0.44%	0		0.00%	0		0.00%	11	0.44%
100	19	0.77%	0		0.00%	0		0.00%	19	0.77%
101	20	0.81%	5	3	0.18%	0		0.00%	25	0.99%
102	19	0.77%	12	8	0.48%	2	1	0.06%	33	1.32%
103	5	0.20%	12	8	0.49%	0		0.00%	17	0.69%
104	6	0.24%	9	6	0.37%	3	2	0.12%	18	0.73%
105	1	0.04%	15	10	0.61%	3	2	0.12%	19	0.77%
106	3	0.12%	21	14	0.86%	2	1	0.06%	26	1.04%
107	1	0.04%	21	14	0.86%	3	2	0.12%	25	1.02%
108	4	0.16%	35	23	1.40%	5	3	0.18%	43	1.75%
109	3	0.12%	20	13	0.79%	6	4	0.24%	29	1.16%
110	2	0.08%	38	25	1.53%	5	3	0.18%	44	1.79%
111	0	0.00%	29	19	1.16%	8	5	0.31%	36	1.47%
112	0	0.00%	56	37	2.26%	17	11	0.67%	73	2.93%
113	2	0.08%	36	24	1.47%	23	15	0.92%	61	2.46%
114		0.00%	53	35	2.14%	17	11	0.67%	70	2.81%
115		0.00%	51	34	2.08%	12	8	0.49%	64	2.57%
116		0.00%	0		0.00%	71	47	2.87%	71	2.87%
117		0.00%	0		0.00%	89	59	3.60%	89	3.60%
118		0.00%	0		0.00%	108	71	4.34%	108	4.34%
119		0.00%	0		0.00%	88	58	3.54%	88	3.54%
120		0.00%	0		0.00%	89	59	3.60%	89	3.60%
121		0.00%	0		0.00%	80	53	3.24%	80	3.24%
122		0.00%	0		0.00%	88	58	3.54%	88	3.54%
123		0.00%	0		0.00%	74	49	2.99%	74	2.99%
124		0.00%	0		0.00%	83	55	3.36%	83	3.36%
125		0.00%	0		0.00%	82	54	3.30%	82	3.30%
126		0.00%	0		0.00%	89	59	3.60%	89	3.60%
127		0.00%	0		0.00%	61	40	2.44%	61	2.44%
128		0.00%	0		0.00%	50	33	2.02%	50	2.02%
129		0.00%	0		0.00%	74	49	2.99%	74	2.99%
130		0.00%	0		0.00%	70	46	2.81%	70	2.81%
131		0.00%	0		0.00%	21	14	0.86%	21	0.86%
132		0.00%	0		0.00%	45	30	1.83%	45	1.83%
133		0.00%	0		0.00%	18	12	0.73%	18	0.73%
134		0.00%	0		0.00%	23	15	0.92%	23	0.92%
135		0.00%	0		0.00%	17	11	0.67%	17	0.67%
136		0.00%	0		0.00%	21	14	0.86%	21	0.86%
137		0.00%	0		0.00%	17	11	0.67%	17	0.67%
138		0.00%	0		0.00%	11	7	0.43%	11	0.43%
139		0.00%	0		0.00%	11	7	0.43%	11	0.43%
140		0.00%	0		0.00%	6	4	0.24%	6	0.24%
141		0.00%	0		0.00%	12	8	0.49%	12	0.49%
142		0.00%	0		0.00%	8	5	0.31%	8	0.31%
143		0.00%	0		0.00%	6	4	0.24%	6	0.24%
144		0.00%	0		0.00%	5	3	0.18%	5	0.18%
145		0.00%	0		0.00%	3	2	0.12%	3	0.12%
146		0.00%	0		0.00%	2	1	0.06%	2	0.06%
147		0.00%	0		0.00%	6	4	0.24%	6	0.24%
148		0.00%	0		0.00%	2	1	0.06%	2	0.06%
149		0.00%	0		0.00%	2	1	0.06%	2	0.06%
150		0.00%	0		0.00%	2	1	0.06%	2	0.06%
151		0.00%	0		0.00%	2	1	0.06%	2	0.06%
152		0.00%	0		0.00%	0		0.00%	0	0.00%
153		0.00%	0		0.00%	0		0.00%	0	0.00%
154		0.00%	0		0.00%	2	1	0.06%	2	0.06%
155		0.00%	0		0.00%	0		0.00%	0	0.00%
156		0.00%	0		0.00%	0		0.00%	0	0.00%
157		0.00%	0		0.00%	2	1	0.06%	2	0.06%
Total	527	21.26%	413	273	16.68%	1539	1016	62.06%	2479	100.00%

Table 10. Observer summary table of red king crab weight samples by statistical area, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Statistical Area	# Crab	Weight lbs.	Average Weight	Range of Ave. wts.	# vessel days[1] sampled
656401	58	160.5	2.8	2.8	1
666401	770	2387.9	3.1	2.6-3.3	14
666330	50	165.3	3.3	3.3-3.4	2
676400	80	247.8	3.1	3.1	1
Total	958	2961.5	3.1	2.6-3.4	18

[1]Total number of days sampled for weights by observer vessels.

Table 11. Carapace length measurement summary of sampled sublegal male red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5, 1890.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
60	5	0.65	1.1%	5	4.55	7.6%	10	1.14	1.9%
61	1	0.13	0.2%	1	0.92	1.5%	2	0.23	0.4%
62	4	0.54	0.9%	3	2.82	4.5%	7	0.82	1.3%
63	1	0.14	0.2%	0	0.00	0.0%	1	0.12	0.2%
64	3	0.42	0.7%	1	0.97	1.5%	4	0.49	0.8%
65	1	0.14	0.2%	1	0.98	1.5%	2	0.25	0.4%
66	2	0.29	0.4%	3	3.00	4.5%	5	0.63	0.9%
67	2	0.28	0.4%	0	0.00	0.0%	2	0.25	0.4%
68	5	0.74	1.1%	0	0.00	0.0%	5	0.65	0.9%
69	4	0.60	0.9%	0	0.00	0.0%	4	0.52	0.8%
70	5	0.75	1.1%	1	1.08	1.5%	6	0.80	1.1%
71	6	0.92	1.3%	0	0.00	0.0%	6	0.81	1.1%
72	9	1.41	2.0%	1	1.09	1.5%	10	1.37	1.9%
73	3	0.48	0.7%	1	1.11	1.5%	4	0.55	0.8%
74	5	0.80	1.1%	2	2.24	3.0%	7	0.98	1.3%
75	10	1.63	2.2%	0	0.00	0.0%	10	1.42	1.9%
76	10	1.65	2.2%	1	1.15	1.5%	11	1.59	2.1%
77	11	1.84	2.4%	0	0.00	0.0%	11	1.61	2.1%
78	12	2.03	2.6%	1	1.18	1.5%	13	1.92	2.5%
79	21	3.60	4.6%	2	2.39	3.0%	23	3.45	4.4%
80	17	2.95	3.7%	1	1.21	1.5%	18	2.73	3.4%
81	11	1.93	2.4%	1	1.23	1.5%	12	1.84	2.3%
82	9	1.60	2.0%	1	1.24	1.5%	10	1.56	1.9%
83	9	1.62	2.0%	0	0.00	0.0%	9	1.42	1.7%
84	17	3.10	3.7%	2	2.55	3.0%	19	3.03	3.6%
85	16	2.95	3.5%	0	0.00	0.0%	16	2.58	3.0%
86	16	2.98	3.5%	2	2.61	3.0%	18	2.94	3.4%
87	9	1.70	2.0%	0	0.00	0.0%	9	1.49	1.7%
88	14	2.67	3.0%	1	1.33	1.5%	15	2.50	2.8%
89	9	1.74	2.0%	2	2.70	3.0%	11	1.86	2.1%
90	16	3.12	3.5%	2	2.73	3.0%	18	3.07	3.4%
91	8	1.58	1.7%	0	0.00	0.0%	8	1.38	1.5%
92	18	3.59	3.9%	1	1.39	1.5%	19	3.32	3.6%
93	14	2.82	3.0%	0	0.00	0.0%	14	2.47	2.7%
94	20	4.08	4.3%	2	2.85	3.0%	22	3.92	4.2%
95	15	3.09	3.3%	3	4.32	4.5%	18	3.24	3.4%
96	19	3.96	4.1%	2	2.91	3.0%	21	3.83	4.0%
97	12	2.52	2.6%	3	4.41	4.5%	15	2.76	2.8%
98	15	3.19	3.3%	1	1.48	1.5%	16	2.98	3.0%
99	6	1.29	1.3%	5	7.50	7.6%	11	2.07	2.1%
100	14	3.04	3.0%	5	7.58	7.6%	19	3.61	3.6%
101	18	3.94	3.9%	2	3.06	3.0%	20	3.83	3.8%
102	15	3.32	3.3%	4	6.18	6.1%	19	3.68	3.6%
103	5	1.12	1.1%	0	0.00	0.0%	5	0.98	0.9%
104	5	1.13	1.1%	1	1.58	1.5%	6	1.18	1.1%
105	1	0.23	0.2%	0	0.00	0.0%	1	0.20	0.2%
106	2	0.46	0.4%	1	1.61	1.5%	3	0.60	0.6%
107	0	0.00	0.0%	1	1.62	1.5%	1	0.20	0.2%
108	4	0.94	0.9%	0	0.00	0.0%	4	0.82	0.8%
109	3	0.71	0.7%	0	0.00	0.0%	3	0.62	0.6%
110	2	0.48	0.4%	0	0.00	0.0%	2	0.42	0.4%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
113	2	0.49	0.4%	0	0.00	0.0%	2	0.43	0.4%
Sum	461		87.5%	66		12.5%	527		100.0%
Mean		87.4			85.5			87.1	

Total sublegals 527

Table 12. Carapace length measurement summary of sampled sublegal male red king crab captured in statistical area 666401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
60	5	0.67	1.1%	5	4.52	7.7%	10	1.17	1.9%
61	1	0.14	0.2%	1	0.94	1.5%	2	0.24	0.4%
62	4	0.55	0.9%	3	2.86	4.6%	7	0.84	1.4%
63	1	0.14	0.2%	0	0.00	0.0%	1	0.12	0.2%
64	3	0.43	0.7%	1	0.98	1.5%	4	0.50	0.8%
65	1	0.14	0.2%	1	1.00	1.5%	2	0.25	0.4%
66	2	0.29	0.4%	3	3.05	4.6%	5	0.64	1.0%
67	2	0.30	0.4%	0	0.00	0.0%	2	0.26	0.4%
68	5	0.76	1.1%	0	0.00	0.0%	5	0.66	1.0%
69	4	0.61	0.9%	0	0.00	0.0%	4	0.54	0.8%
70	5	0.78	1.1%	1	1.08	1.5%	6	0.82	1.2%
71	5	0.79	1.1%	0	0.00	0.0%	5	0.69	1.0%
72	8	1.28	1.8%	1	1.11	1.5%	9	1.26	1.8%
73	3	0.49	0.7%	1	1.12	1.5%	4	0.57	0.8%
74	5	0.82	1.1%	2	2.28	3.1%	7	1.01	1.4%
75	9	1.50	2.0%	0	0.00	0.0%	9	1.31	1.8%
76	9	1.52	2.0%	1	1.17	1.5%	10	1.48	1.9%
77	11	1.89	2.4%	0	0.00	0.0%	11	1.65	2.1%
78	12	2.08	2.7%	1	1.20	1.5%	13	1.97	2.5%
79	21	3.69	4.7%	2	2.43	3.1%	23	3.54	4.5%
80	17	3.03	3.8%	1	1.23	1.5%	18	2.80	3.5%
81	11	1.98	2.4%	1	1.25	1.5%	12	1.89	2.3%
82	9	1.64	2.0%	1	1.26	1.5%	10	1.60	1.9%
83	9	1.66	2.0%	0	0.00	0.0%	9	1.45	1.8%
84	17	3.18	3.8%	2	2.58	3.1%	19	3.11	3.7%
85	16	3.03	3.6%	0	0.00	0.0%	16	2.65	3.1%
86	15	3.06	3.6%	2	2.65	3.1%	18	3.01	3.5%
87	9	1.74	2.0%	0	0.00	0.0%	9	1.52	1.8%
88	14	2.74	3.1%	1	1.35	1.5%	15	2.57	2.9%
89	9	1.78	2.0%	2	2.74	3.1%	11	1.90	2.1%
90	16	3.21	3.6%	2	2.77	3.1%	18	3.15	3.5%
91	8	1.62	1.8%	0	0.00	0.0%	8	1.42	1.6%
92	17	3.48	3.8%	1	1.42	1.5%	18	3.22	3.5%
93	13	2.69	2.9%	0	0.00	0.0%	13	2.35	2.5%
94	20	4.19	4.5%	2	2.89	3.1%	22	4.02	4.3%
95	14	2.96	3.1%	3	4.38	4.6%	17	3.14	3.3%
96	19	4.06	4.2%	2	2.95	3.1%	21	3.92	4.1%
97	11	2.38	2.4%	3	4.48	4.6%	14	2.64	2.7%
98	15	3.27	3.3%	1	1.51	1.5%	16	3.05	3.1%
99	6	1.32	1.3%	5	7.62	7.7%	11	2.12	2.1%
100	13	2.90	2.8%	5	7.69	7.7%	18	3.50	3.5%
101	18	4.05	4.0%	1	1.55	1.5%	19	3.73	3.7%
102	12	2.73	2.7%	4	6.28	6.2%	16	3.18	3.1%
103	5	1.15	1.1%	0	0.00	0.0%	5	1.00	1.0%
104	5	1.16	1.1%	1	1.60	1.5%	6	1.21	1.2%
105	1	0.23	0.2%	0	0.00	0.0%	1	0.20	0.2%
106	2	0.47	0.4%	1	1.63	1.5%	3	0.62	0.6%
107	0	0.00	0.0%	1	1.65	1.5%	1	0.21	0.2%
108	4	0.96	0.9%	0	0.00	0.0%	4	0.84	0.8%
109	3	0.73	0.7%	0	0.00	0.0%	3	0.64	0.6%
110	2	0.49	0.4%	0	0.00	0.0%	2	0.43	0.4%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
113	2	0.50	0.4%	0	0.00	0.0%	2	0.44	0.4%
sum	449		87.4%	65		12.6%	514		100.0%
Mean		87.3			85.3			87.1	

Total sublegals 514

Table 13. Carapace length measurement summary of sampled sublegal male red king crab captured in statistical area 676400 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
71	1	5.92	8.3%	0	0.00	0.0%	1	5.46	7.7%
72	1	6.00	8.3%	0	0.00	0.0%	1	5.54	7.7%
73	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
74	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
75	1	6.25	8.3%	0	0.00	0.0%	1	5.77	7.7%
76	1	6.33	8.3%	0	0.00	0.0%	1	5.85	7.7%
77	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
78	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
79	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
80	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
81	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
82	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
83	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
84	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
85	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
86	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
87	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
88	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
89	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
90	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
91	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
92	1	7.67	8.3%	0	0.00	0.0%	1	7.08	7.7%
93	1	7.75	8.3%	0	0.00	0.0%	1	7.15	7.7%
94	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
95	1	7.92	8.3%	0	0.00	0.0%	1	7.31	7.7%
96	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
97	1	8.08	8.3%	0	0.00	0.0%	1	7.46	7.7%
98	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
99	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
100	1	8.33	8.3%	0	0.00	0.0%	1	7.69	7.7%
101	0	0.00	0.0%	1	101.00	100.0%	1	7.77	7.7%
102	3	25.50	25.0%	0	0.00	0.0%	3	23.54	23.1%
sum	12		92.3%	1		7.7%	13		100.0%
Mean		89.8			101.0			90.6	

Total sublegals 13

Table 14. Carapace length measurement and percent ovigerity summary of sampled female red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

Stat.Area All Vessel All Date 8 1-5 90

JUVENILE		ADULT SIZE PER % OVIGERITY							ADULT SIZE PER % OVIGERITY						
mm	no.	mm	Full	Hi	Med	Low	0	Sum	mm	Full	Hi	Med	Low	0	Sum
50		60						0	91						0
51		61						0	92			1			1
52	1	62						0	93			1			1
53		63						0	94						0
54	1	64						0	95						0
55	1	65						0	96						0
56		66						0	97		1				1
57		67			1			1	98						0
58	1	68						0	99						0
59		69						0	100						0
60		70	1					1	101			1			1
61		71			1			1	102						0
62		72	1		1	1		3	103						0
63		73	1					1	104						0
64		74		2				2	105						0
65	1	75	1	3				4	106						0
66	1	76						0	107						0
67	1	77		3				3	108						0
68	1	78		3	1			4	109						0
69	1	79	1	3	1			5	110						0
70		80		4		1		5	111						0
71	2	81		5				5	112						0
72	1	82	1	2	1			4	113						0
73		83	3	3				6	114						0
74		84	2		1			3	115						0
75		85		1	1			2	116						0
76	1	86		1				1	117						0
77		87		3	1			4	118						0
78	1	88	1	1	1			3	119						0
79		89				1		1	120						0
80		90		1				1	121						0
	14		12	35	10	3	0	60		0	1	3	0	0	4

TOTAL ADULTS/OVIGERIT - - 12 36 13 3 0 64

% ADULTS/OVIGERITY - - - 18.7 56.2 20.3 4.6 0

MEAN 65.9 WEIGHTED MEAN ADULT LENGTH -- 81.2

VAR. 66.9 VARIANCE OF THE MEAN LENGTH -- 40.3

Full=90-100%, Hi=60-89%, Med=30-59%, Lo=1-29%

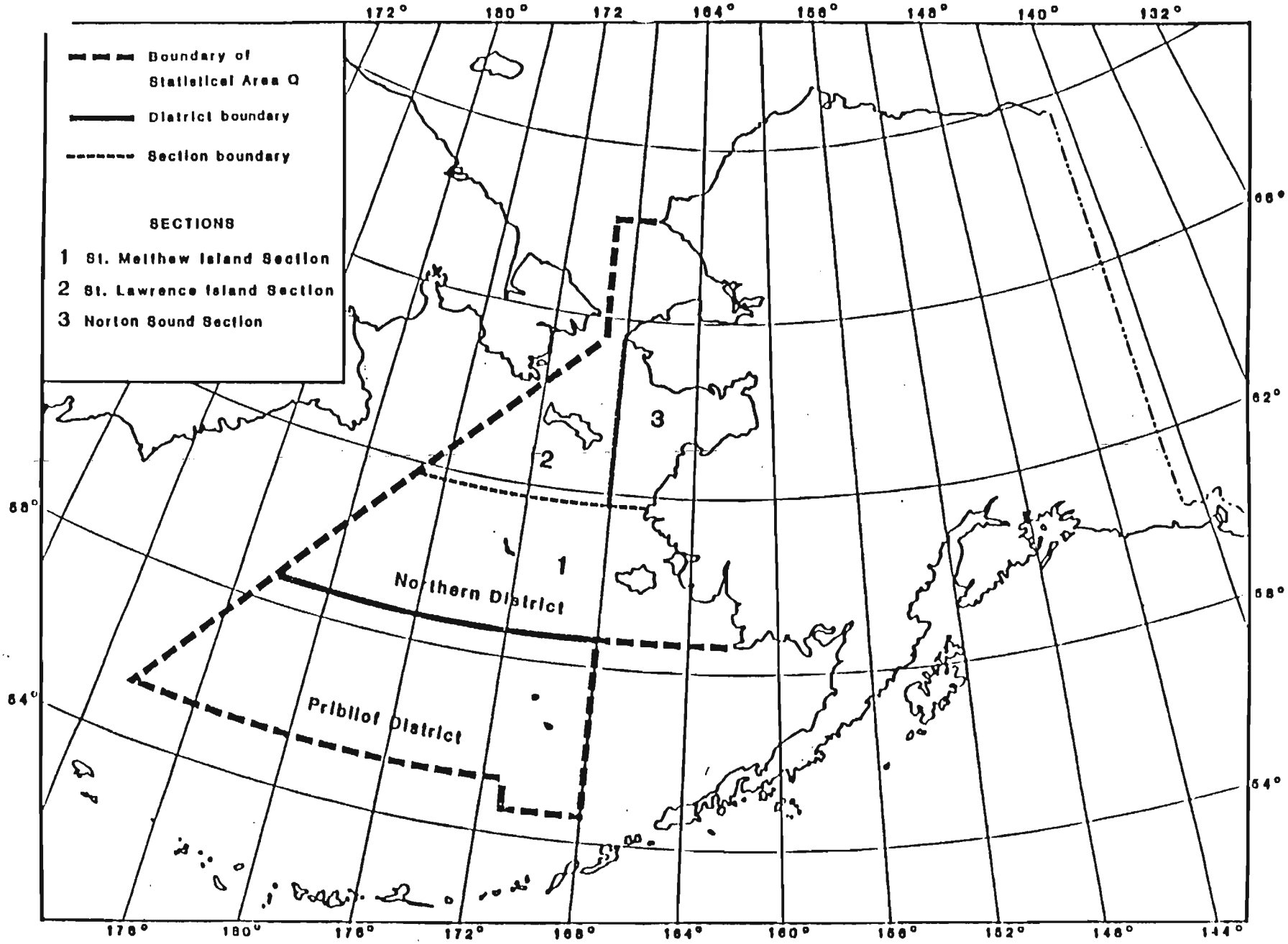

Figure 1. King crab fishing districts and sections of Statistical Area Q

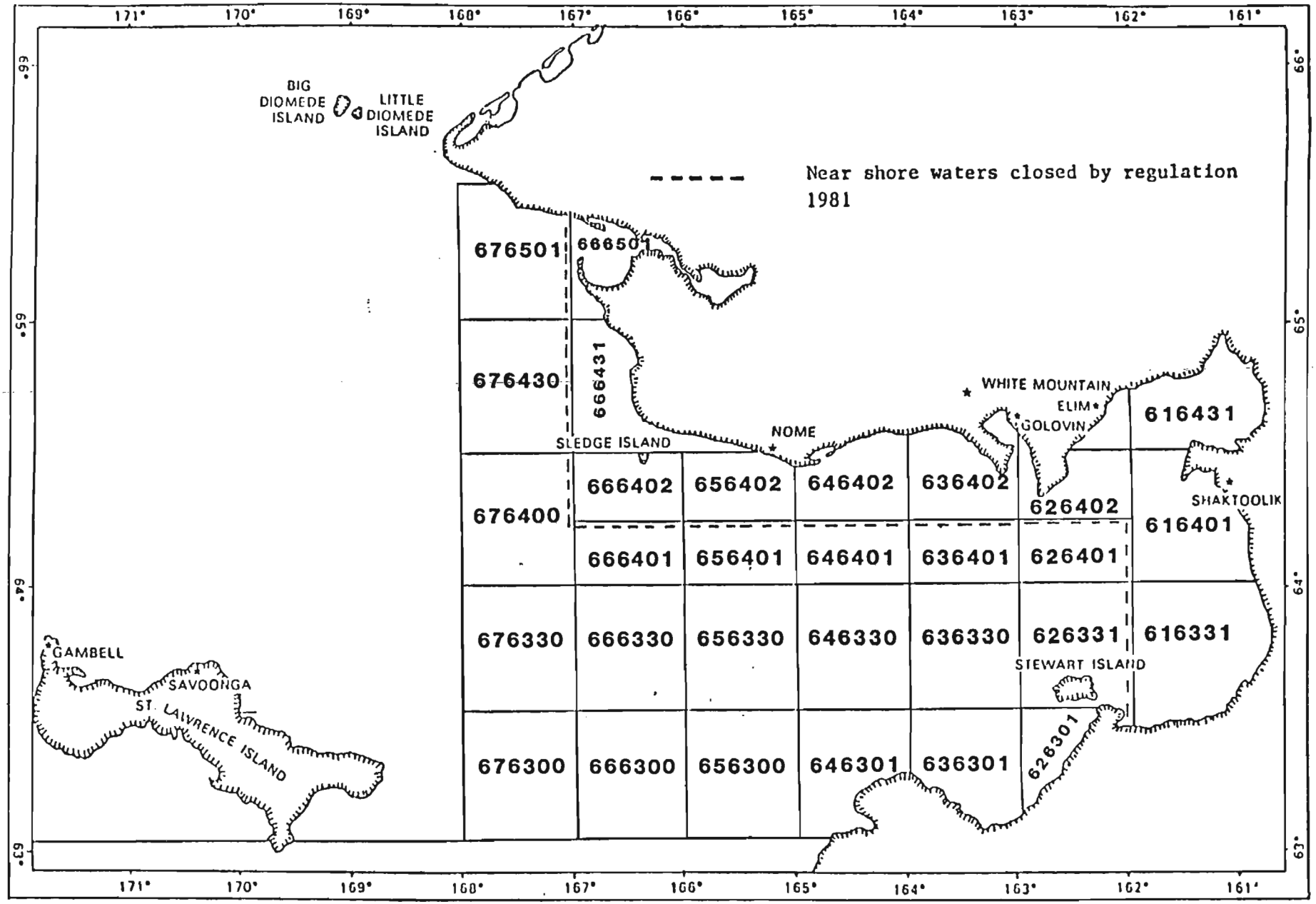

Figure 2. Statistical areas for the Norton Sound red king crab fishery.

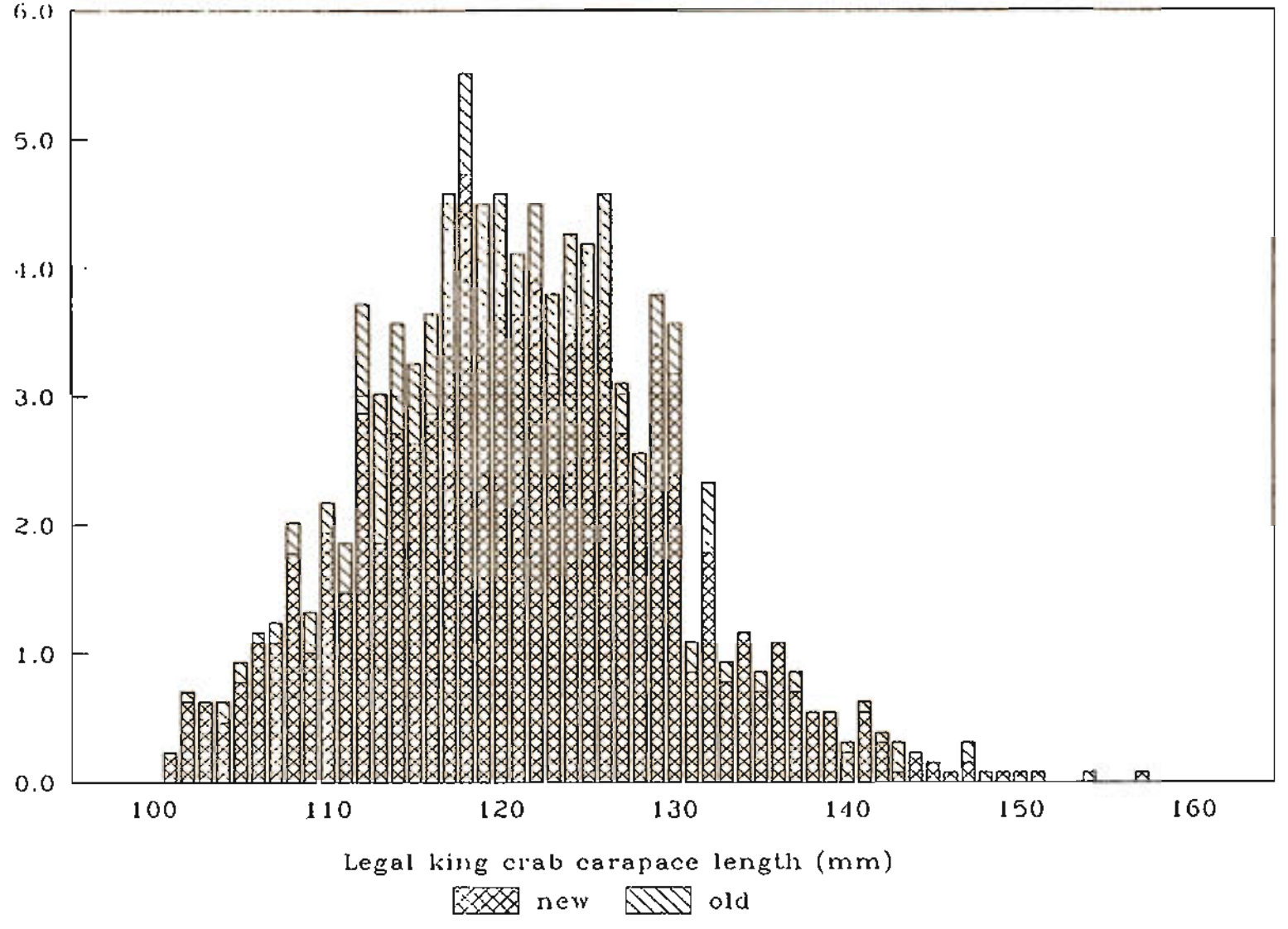

Figure 3. Length frequency distribution and frequency of new and old carapace age condition of legal male red king crab, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

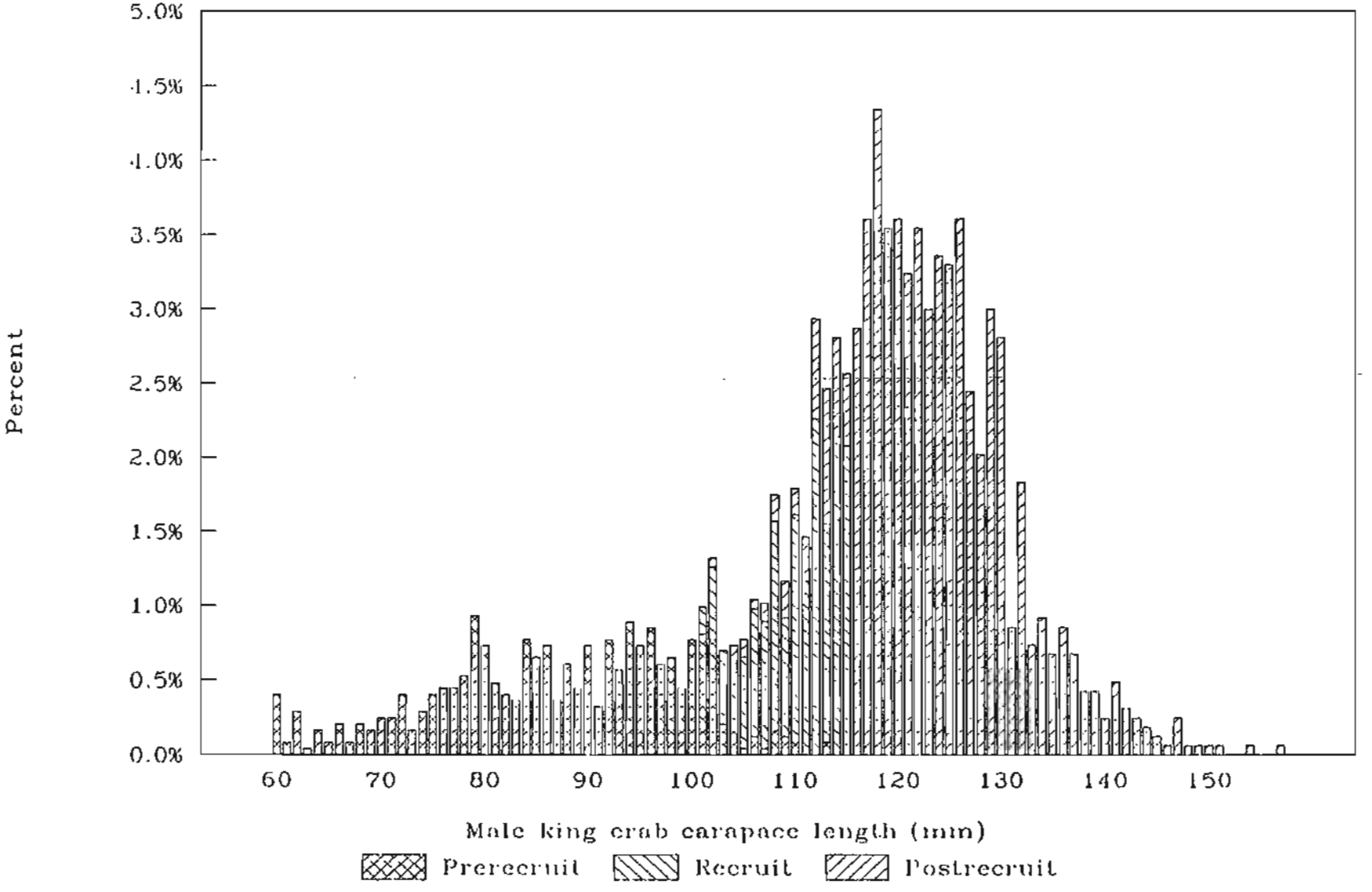

Figure 4. Length frequency distribution of prerecruit, recruit, and postrecruit male red king crab, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

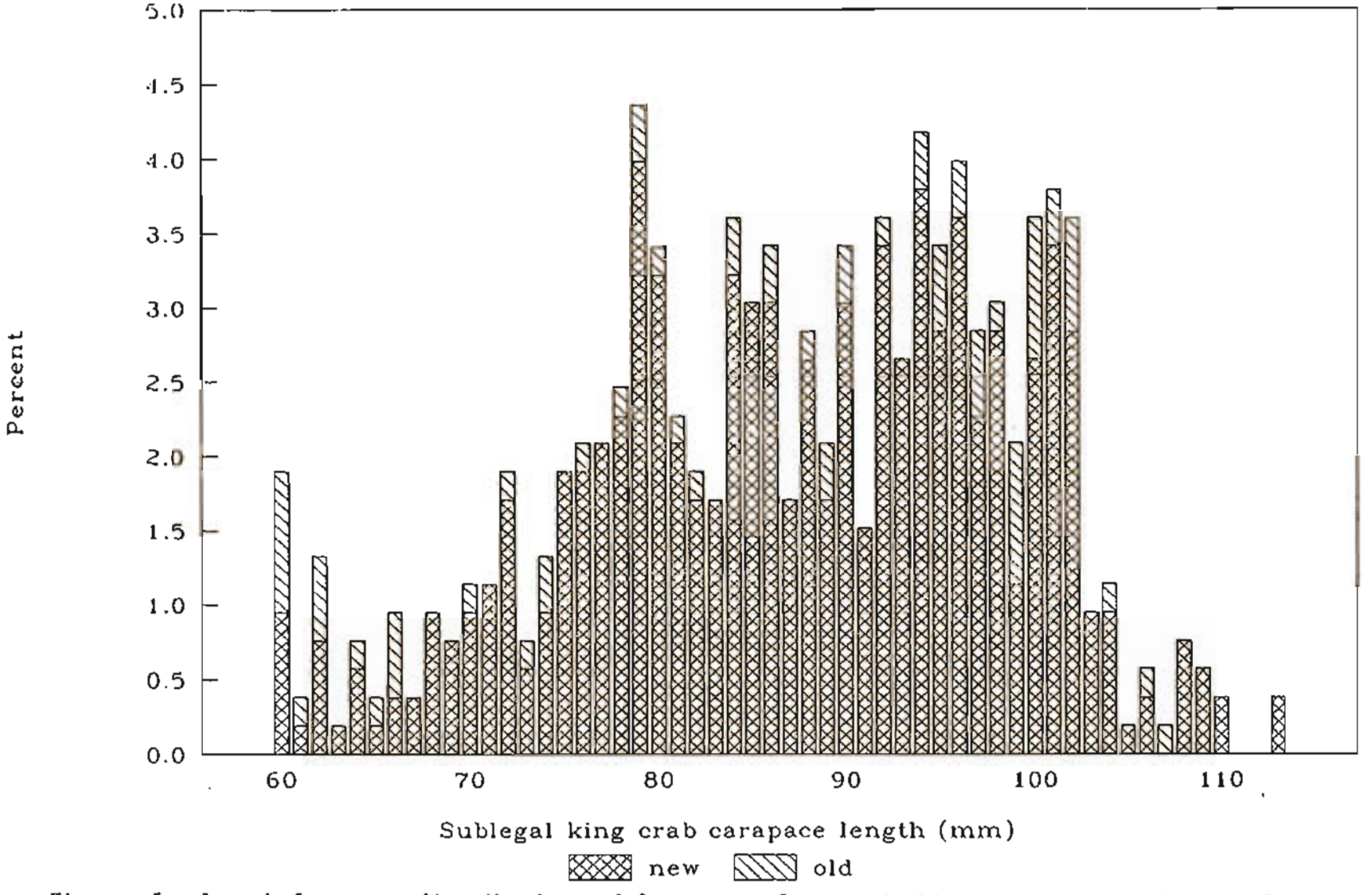

Figure 5. Length frequency distribution and frequency of new and old carapace age condition of prerecruit male king crab, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.

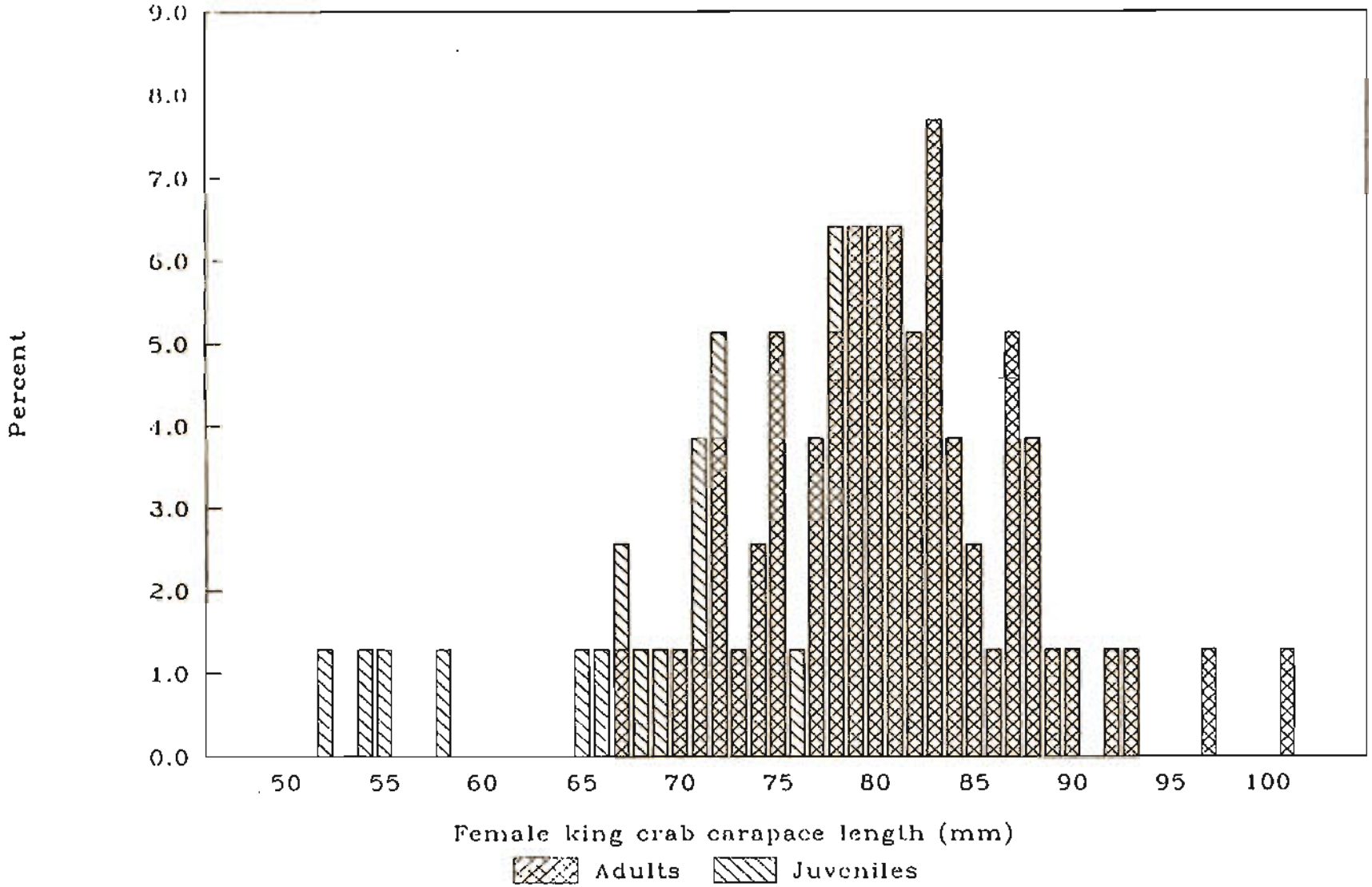

Figure 6. Length frequency distribution of female red king crab, juveniles and adults, Norton Sound Section, Eastern Bering Sea, August 1-5, 1990.